

This Page Is Inserted by IFW Operations  
and is not a part of the Official Record

## **BEST AVAILABLE IMAGES**

Defective images within this document are accurate representation of  
The original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

**IMAGES ARE BEST AVAILABLE COPY.**

**As rescanning documents *will not* correct images,  
please do not report the images to the  
Image Problem Mailbox.**



PCT

WORLD INTELLECTUAL PROPERTY ORGANIZATION  
International Bureau



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<b>(51) International Patent Classification <sup>5</sup> :</b> <b>B65D 81/28</b>	<b>A1</b>	<b>(11) International Publication Number:</b> <b>WO 94/26622</b> <b>(43) International Publication Date:</b> 24 November 1994 (24.11.94)
<b>(21) International Application Number:</b> PCT/GB94/01077 <b>(22) International Filing Date:</b> 19 May 1994 (19.05.94)  <b>(30) Priority Data:</b> 9310313.3                      19 May 1993 (19.05.93)                      GB  <b>(71) Applicant (for all designated States except US):</b> GLE-NEAGLES SPRING WATERS COMPANY LIMITED [GB/GB]; The Maltings, Moray Street, Blackford, Perthshire PH4 1OF (GB).  <b>(72) Inventor; and</b> <b>(75) Inventor/Applicant (for US only):</b> HAMILTON, John, Stewart [GB/GB]; The Orchard, Kirkton of Mailer, Perth PH2 0ST (GB).  <b>(74) Agent:</b> FRANK B. DEHN & CO.; Imperial House, 15-19 Kingsway, London WC2B 6UZ (GB).		<b>(81) Designated States:</b> CA, GB, JP, US, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).  <b>Published</b> <i>With international search report.</i>
<b>(54) Title:</b> METHOD FOR THE STERILE PRESERVATION OF A LIQUID IN A CONTAINER  <b>(57) Abstract</b> <p>In order to prevent bacteria in a container (1) for storing liquid for human consumption, the container or bottle (1) incorporates internally a deposit (3) of a material which destroys micro-organisms.</p> <div><p>The diagram shows a cross-section of a container (1) with a neck (2). Inside the neck, there is a deposit (3) of a material which destroys micro-organisms. A label (4) is attached to the neck.</p></div>		

**FOR THE PURPOSES OF INFORMATION ONLY**

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AT	Austria	GB	United Kingdom	MR	Mauritania
AU	Australia	GE	Georgia	MW	Malawi
BB	Barbados	GN	Guinea	NE	Niger
BE	Belgium	GR	Greece	NL	Netherlands
BF	Burkina Faso	HU	Hungary	NO	Norway
BG	Bulgaria	IE	Ireland	NZ	New Zealand
BJ	Benin	IT	Italy	PL	Poland
BR	Brazil	JP	Japan	PT	Portugal
BY	Belarus	KE	Kenya	RO	Romania
CA	Canada	KG	Kyrgyzstan	RU	Russian Federation
CF	Central African Republic	KP	Democratic People's Republic of Korea	SD	Sudan
CG	Congo	KR	Republic of Korea	SE	Sweden
CH	Switzerland	KZ	Kazakhstan	SI	Slovenia
CI	Côte d'Ivoire	LI	Liechtenstein	SK	Slovakia
CM	Cameroon	LK	Sri Lanka	SN	Senegal
CN	China	LU	Luxembourg	TD	Chad
CS	Czechoslovakia	LV	Larvia	TG	Togo
CZ	Czech Republic	MC	Monaco	TJ	Tajikistan
DE	Germany	MD	Republic of Moldova	TT	Trinidad and Tobago
DK	Denmark	MG	Madagascar	UA	Ukraine
ES	Spain	ML	Mali	US	United States of America
FI	Finland	MN	Mongolia	UZ	Uzbekistan
FR	France			VN	Viet Nam
GA	Gabon				

METHOD FOR THE STERILE PRESERVATION  
OF A LIQUID IN A CONTAINER

5           This invention relates to containers for storing liquids and is particularly, but not exclusively, applicable to containers for storing liquid for human consumption.

10           The invention is concerned particularly with water containers or bottles such as are used in retailing still waters, including mineral waters.

          The term "bottle" in this context includes a closure therefor.

15           According to the present invention, there is provided a container or bottle incorporating internally a deposit of a material which destroys micro-organisms.

          Preferably, the said material is metallic silver or a silver salt.

20           Preferably, the said material is present in the pores of a porous ceramic element or within a fine ceramic structure.

25           Preferably, the said material is present as a micro-thin layer on at least part of the inside surface of the container or bottle. For example the layer may be deposited in an annular band on the inside surface of the container.

30           Preferably, in the case of a bottle, the said material is present on the inside of the bottle closure. This may have manufacturing advantages over forming the deposit in the body of the bottle. In one particularly preferred form the material is silver which is impregnated in a bead or pellet of finely porous ceramic which is disposed within a ring depending from the top of the bottle closure. The pellet is retained within  
35           the ring by bending the edge of the ring inwards on the application of heat thereto.

- 2 -

Preferred embodiments of the invention will now be described, by way of example only, with reference to the accompanying drawings wherein:

Fig. 1 shows a bottle incorporating a deposit of bactericidal material in accordance with one embodiment  
5 of the invention;

Fig. 2 shows a bottle incorporating a deposit of a bactericidal material in accordance with another embodiment of the invention.

Fig. 3 shows the cap of a container according to a preferred embodiment of the invention.  
10

In one example of a bottle 1 in accordance with the present invention, as shown in Fig. 1, a bead or pellet 3 of fine ceramic structure, which, when baked, has a porous structure, has finely divided metallic silver  
15 anchored within the fine structure or porosity. The bead or pellet may be made by mixing a ceramic paste with silver and baking it so that the silver is exposed throughout the porous structure. The bead or pellet 3 is fixed substantially centrally inside the bottle cap  
20 2. The bead or pellet 3 may be deposited within an inner cage or ring 4 formed by a downwardly depending wall arranged concentrically within the sides of the cap 2. This is then sealed by heat treatment.

In a preferred embodiment, the impregnated pellet 3  
25 is locked into a modified bottle cap as shown in Fig. 3. A substantially circular wall 4 is formed inside the cap 2, extending a short distance from the top 6 of the cap 2 and formed concentrically with, and inwardly of, the cap wall 7. The impregnated pellet 3 is then placed  
30 within this ring 4. The ring 4 is preferably made of a plastics material. The edge distal from the top of the cap is heated and bent inwards to fix the pellet 3 within the ring 4.

In another example of a bottle 1 in accordance with  
35 the present invention, as shown in Fig. 2, a micro-thin deposit of metallic silver forms an annular band 5 on

- 3 -

part of the inside surface of the bottle 1.  
Alternatively, the deposit could be positioned at the  
base of the bottle as shown at 8.

5 In each example, the silver present acts in a  
bactericidal manner with the advantage that high purity  
of the product contained in the bottle 1 is preserved  
subsequent to opening. Tests have proved that a pellet  
3 inserted in a container 1 as described is effective  
against microbes.

10 It will be preferable to dispose the bottle 1 on  
its side in order to promote contact between the  
contents and the silver-bearing element or deposit.

Although in the preferred embodiment the container  
is used to store liquids for human consumption, e.g.  
spring water, it may also have other applications where  
15 it is necessary to store a pure liquid which must be  
kept free of bacteria, such as contact lens solution.

- 4 -

Claims

1. A container for storing liquids, said container incorporating internally a deposit of a material which destroys micro-organisms.

5

2. The container of claim 1, wherein said material is metallic silver or a silver salt.

10

3. The container of claim 1 or 2 wherein said material is present in the pores of a porous ceramic element.

4. The container of claim 1 or 2 wherein said material is present within a fine ceramic structure.

15

5. The container of any preceding claim wherein said material is present as a micro-thin layer on at least part of the inside surface of said container.

20

6. The container of any preceding claim wherein said container is a bottle and said material is present on the inside of the bottle closure.

7. The container of claim 6 wherein said material is in the form of a bead or pellet.

25

8. The container of claim 7 wherein said pellet is disposed in a ring depending from the top of said bottle closure.

30

9. The container of claim 8 wherein said pellet is retained within said ring by applying heat to the edge of said ring.



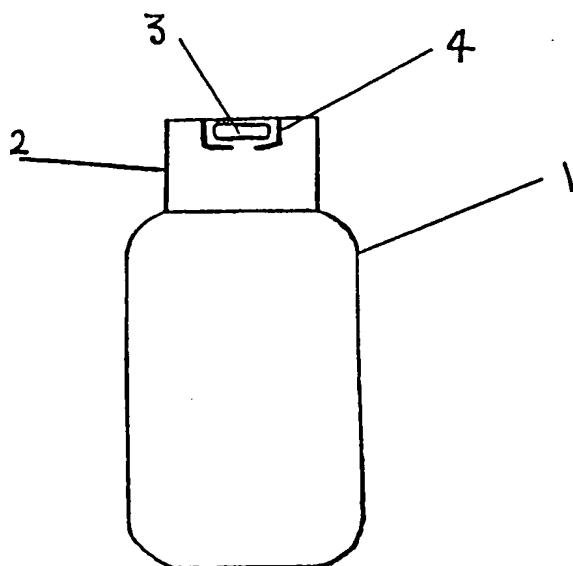


FIG 1

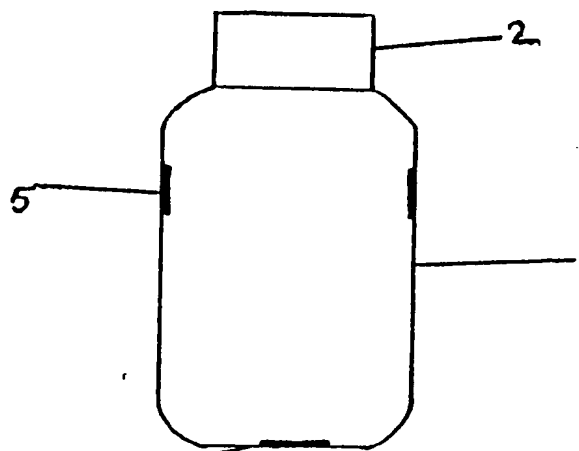


FIG 2

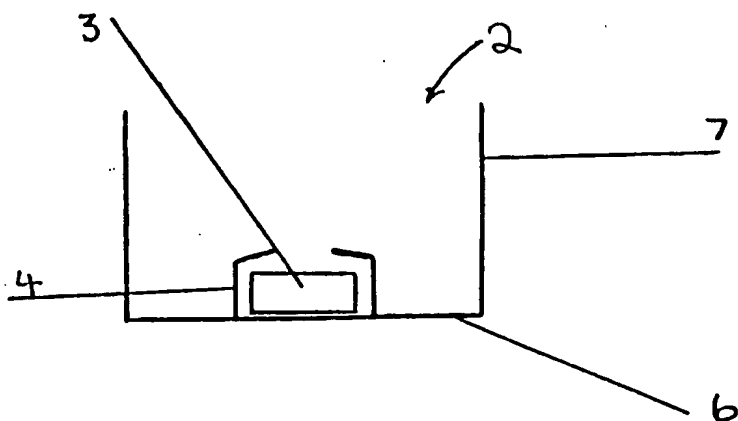


FIG 3

## INTERNATIONAL SEARCH REPORT

Intern. Application No.

PCT/GB 94/01077

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 5 B65D81/28

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 5 B65D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	US,A,3 092 552 (ROMANS) 4 June 1963 see column 1, line 19 - line 41 ---	1,2,5 3,4,6
Y A	EP,A,0 322 171 (NISSHO) 28 June 1989 see column 1, line 40 - column 2, line 14 see column 3, line 1 - line 29 ---	3,4 7
Y A	GB,A,1 259 100 (GRANTS) 5 January 1972 see page 1, line 72 - line 83 see page 2, line 40 - line 87 ---	6 7-9
A	US,A,2 541 525 (LEWYT) 4 June 1949 see the whole document -----	8,9



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

## \* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "I" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

26 July 1994

Date of mailing of the international search report

- 4. 08. 94

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+ 31-70) 340-2040, Tx. 31 651 epo nl,  
Fax: (+ 31-70) 340-3016

Authorized officer

Newell, P

# INTERNATIONAL SEARCH REPORT

on on patent family members

al Application No

PCT/GB 94/01077

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US-A-3092552		NONE	
EP-A-0322171	28-06-89	JP-A- 1165337	29-06-89
GB-A-1259100	05-01-72	NONE	
US-A-2541525		NONE	

**THIS PAGE BLANK (USPTO)**